

**MULTIBIT DELTA-SIGMA MODULATOR  
WITH VARIABLE-LEVEL QUANTIZER**

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5 **ABSTRACT OF THE DISCLOSURE**

A method of operating a delta-sigma modulator by providing a variable-level quantizer, which selectively enables an additional quantizer level(s) during a ramp up sequence of the modulator. The additional quantizer level(s) is/are disabled during normal operation. The quantizer truncates a summer output and selectively enables the additional quantizer levels by clipping the truncated sum within a first range of quantizer levels during the ramp up sequence and within a second range of quantizer levels during normal operation in which there are more quantizer levels in the first range than in the second range. The quantizer preferably enables at least two additional quantizer levels at a low end of the quantizer range. For example, the range of quantizer levels for normal operation of the modulator can be from -6 to +6, while the range of quantizer levels for ramp up operation of the modulator can be from -8 to +7.